

a microcomputer disposed within a connector configured to connect the microcomputer to an external device; and

a conductor electrically connecting said gas concentration sensor and said microcomputer for transmission of the signal from said gas concentration sensor to said microcomputer;

wherein the microcomputer is configured to process the signal outputted from said gas concentration sensor to produce a voltage signal indicative of the concentration of said at least one of NO<sub>x</sub>, HC, and CO; and

wherein said microcomputer includes an impedance measuring circuit measuring an impedance of the sensor element of said gas concentration sensor and said microcomputer controls a power supply to a heater which heats the sensor element,

said microcomputer controlling said power supply as a function of the measured impedance.

5. (Twice Amended) A gas concentration measuring apparatus as set forth in claim 3, wherein the gas concentration measuring apparatus is mounted in a vehicle, and wherein said microcomputer outputs said signal to a vehicular engine electronic control unit by serial communication.

6. (Twice Amended) A gas concentration measuring apparatus as set forth in claim 3, wherein said sensor element includes a first cell responsive to application of a voltage to discharge oxygen contained in the gasses outside said gas concentration sensor, producing a first electric current as a function of concentration of the discharged oxygen and a second cell responsive to application of a voltage to produce a second electric current as a function of

concentration of a specified gas component contained in the gasses from which the oxygen is discharged by the first cell.

β 2      7. (Twice Amended) A gas concentration measuring apparatus as set forth in claim 3, wherein said microcomputer compensates for unit-to-unit variation in the characteristics of said gas concentration sensor.

12. (Twice Amended) A gas concentration measuring apparatus as set forth in claim 3, further comprising:

an impedance measuring circuit measuring an impedance of a sensor element of said gas concentration sensor,

β 3      a heater which heats a sensor element of said gas concentration sensor, and a heater control circuit which controls a power supply to said heater,

and wherein said microcomputer, said impedance measuring circuit, and said heater control circuit are formed on a bare chip mounted on a ceramic substrate.